

E9-1-1 – The Future Is Now

IP-enabled E9-1-1

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9-1-1 Centers and Net Sensors

The `Warfighters' for 9-1-1 are:

- 9-1-1 Centers (PSAPs – public safety answering points)
 - In excess of 5700 primary PSAPs in nearly 3200 US Counties
- Other first responders (Law, Fire, EMS)
- Directly related emergency centers (EMC, trauma, etc)

Sensor data usable for 9-1-1 Centers must be:

- Discoverable when needed
- Automatically routable or accessible based on location
- IP compatible
- XML based
- Interpretable quickly
- Questions: Secure vs Public – subscription, activation, etc

Some Basics on today's E9-1-1

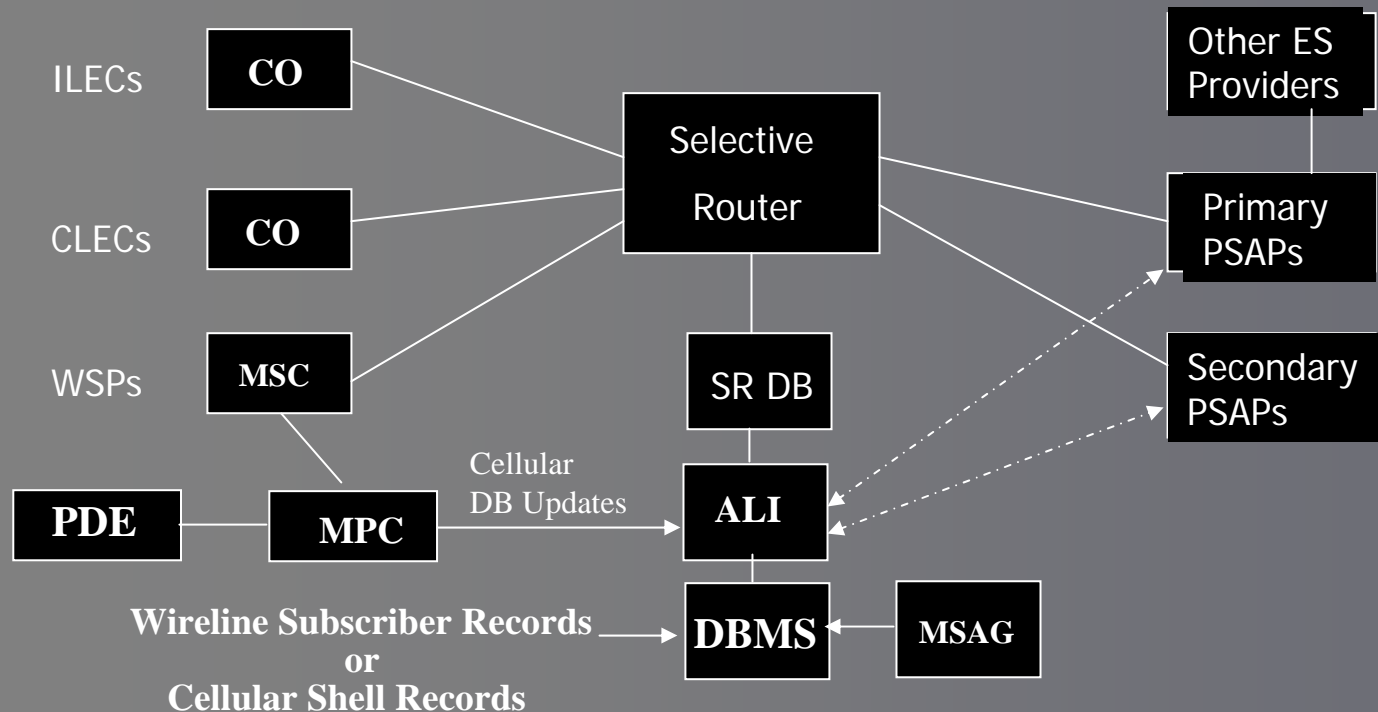
Originating service providers:

- ILECs (Incumbent Local Exchange Carriers)
- CLECs (Competitive Local Exchange Carriers)
- Private Switches via both ILECs and CLECs
- Cellular wireless carriers
- Voice over Internet specifically
- Voice over IP (Internet Protocol) in general

Pre-VOIP E9-1-1 Components

Originating Calls

Emergency Service Providers



Difficult and costly to integrate new call or messaging sources, and the corresponding data needs

Basics

VoIP and IP are another call technology type

But,

IP is also a means for E9-1-1's future

IP appears to be the technology by which the
NENA E9-1-1 Future Path Plan can be realized

Adaptations of the current E9-1-1 infrastructure
cannot effectively support 9-1-1 service needs
in the longer term

Considerations

The trend is toward self-location by the origination device, especially for mobility cases that are growing toward being the majority of new applications

IP-based or compatible devices will send their location as part of the emergency call or non-voice message. This strongly recommends that the transport process be capable of handling this data 'in-network'.

(This was not possible for Wireless E9-1-1 Phase II because the PDE was not and is not yet fast enough to meet the timing of voice network transport.)

Technical solution development for IP supporting combined voice and data flow in the E9-1-1 system is well underway.

Basics

Upcoming and unknown devices with IP interfaces

What should the target for the future be?

End to end IP-based E9-1-1

- Critical to verify assumptions against E9-1-1 functionality

Seamless linkage with other evolving emergency systems

And transition plans to get there

Basics

Quantum leap from current E9-1-1 systems to full IP-enabled E9-1-1 is unlikely

Transition plan needed - in as few standardized steps as possible, and smoothing investments over time where possible

Transition development must find the best migratory process for each call/emergency messaging technology

VoI, general VoIP, WiFi, WiMax,

ILEC/CLEC, cellular MSCs, MSS, ???

IP-based E9-1-1 (**NG9-1-1**) must support all

How Did We Start?

The NENA organization and its resources represents

- combined Public Safety / Industry knowledge point,
- assumption checkpoint for what 9-1-1 does,
- and what 9-1-1 needs to do

NENA's Future Path Plan attempted to conceptually frame these issues, by setting a developmental target for the future evolution of E9-1-1

Future Path Plan Criteria describes fundamental parameters for effective E9-1-1 service

Objectives of the Future Path Plan

Solutions must :

- Provide parity of service across users
- Retain needed E9-1-1 features/capabilities
- Maintain/improve security, be highly non-disruptable
- Use mainstream technology
 - Minimize cost, enhance maintainability
- Have plug-and-play integration capability
- Identify relationship of general Internet and `private' emergency services IP networks as applied to future E9-1-1 and transition (a major current issue)

NENA NG9-1-1 Principles

1. Support E9-1-1 VoIP Policy Plan
2. Encourage Vendor/Technology Neutral Solutions and Innovation
3. Retain Consumer Service Quality Expectations
4. Support Dynamic, Flexible, Open Architecture System Design Process for 9-1-1

NENA NG9-1-1 Principles

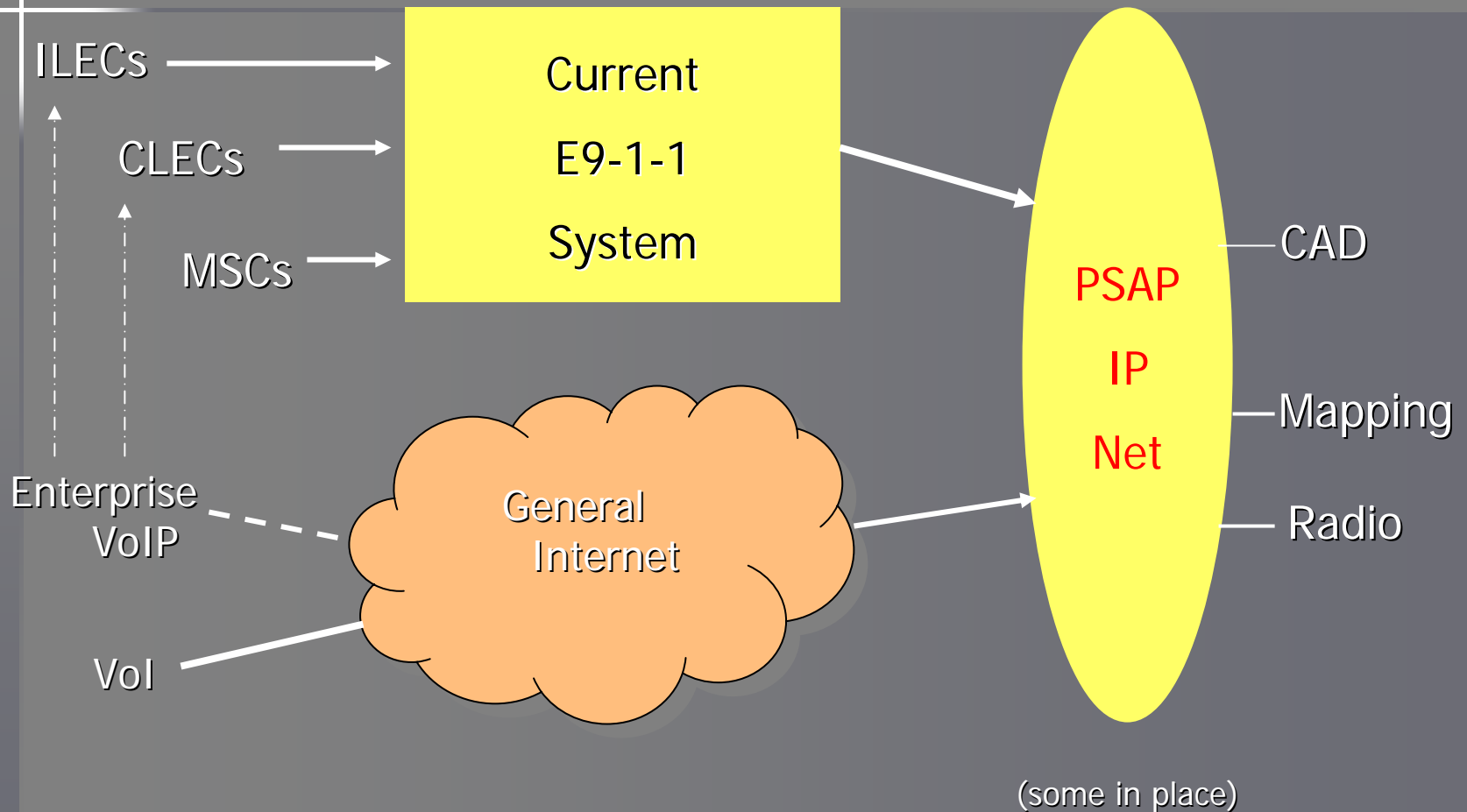
5. Develop Policies for 9-1-1
Compatible with the Commercial
Environment for IP Communications
6. Promote a Fully Funded 9-1-1 System

Simplify the architecture, maximize flexibility, retain all previous features, add new features, enable plug and play for additional/future devices

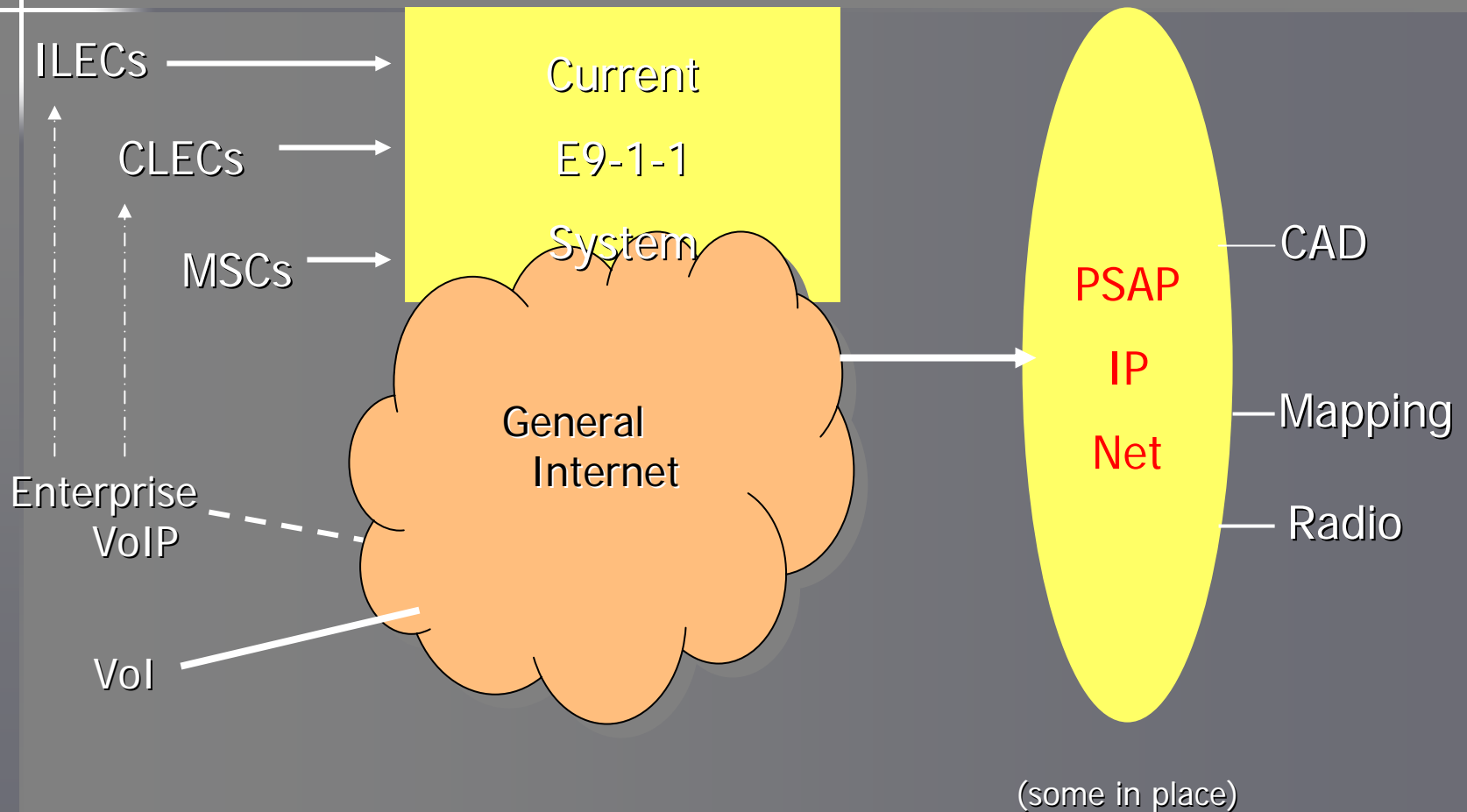
Issues for Future NG9-1-1

- Non-local phone numbers
- Nomadic services
- Mobility, WiFi/WiMax
- Data rich environment and Needs
- Existing 9-1-1 infrastructure
- Funding evolution
- Policy evolution
- Wide-ranging education needs

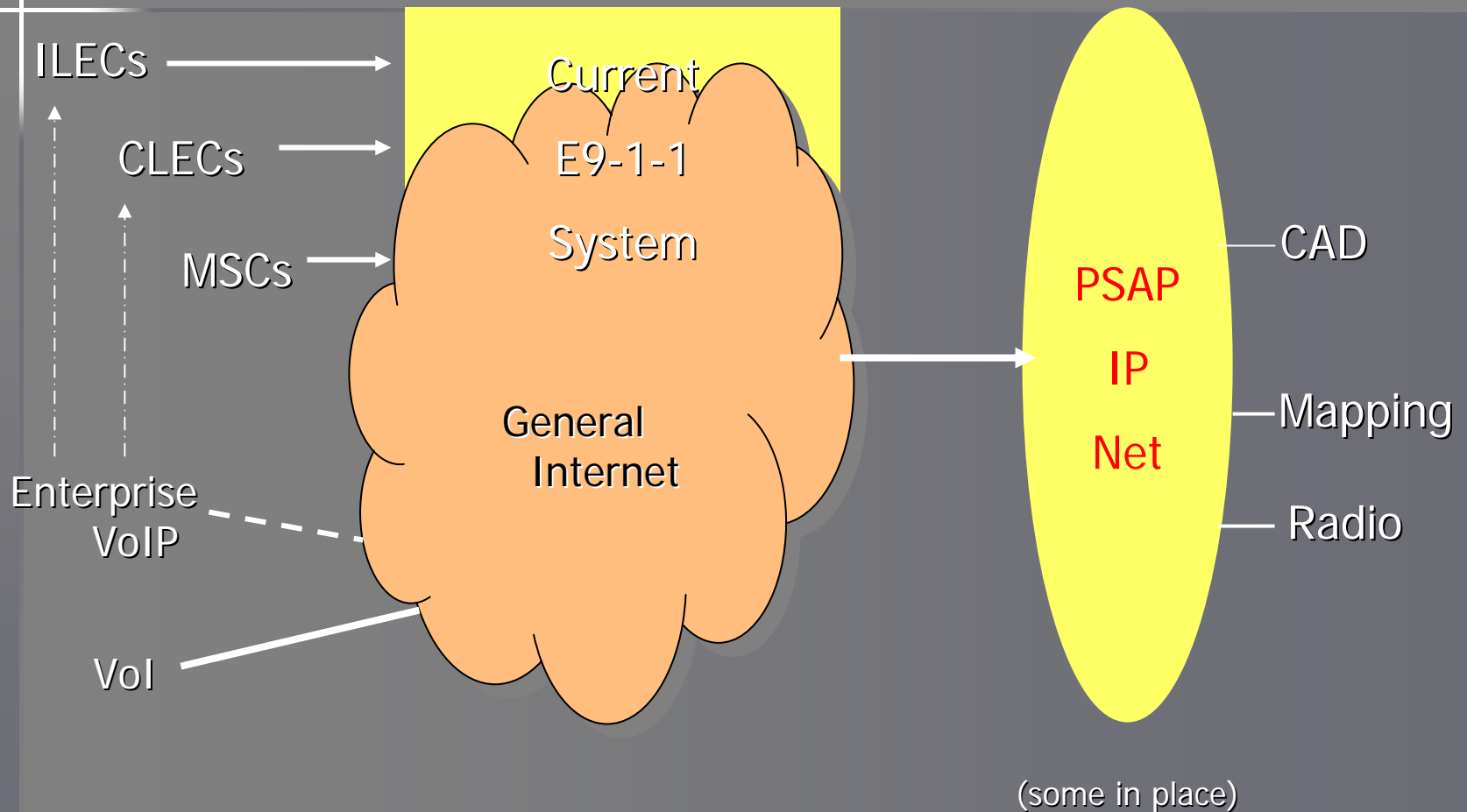
Three Structures for NG9-1-1



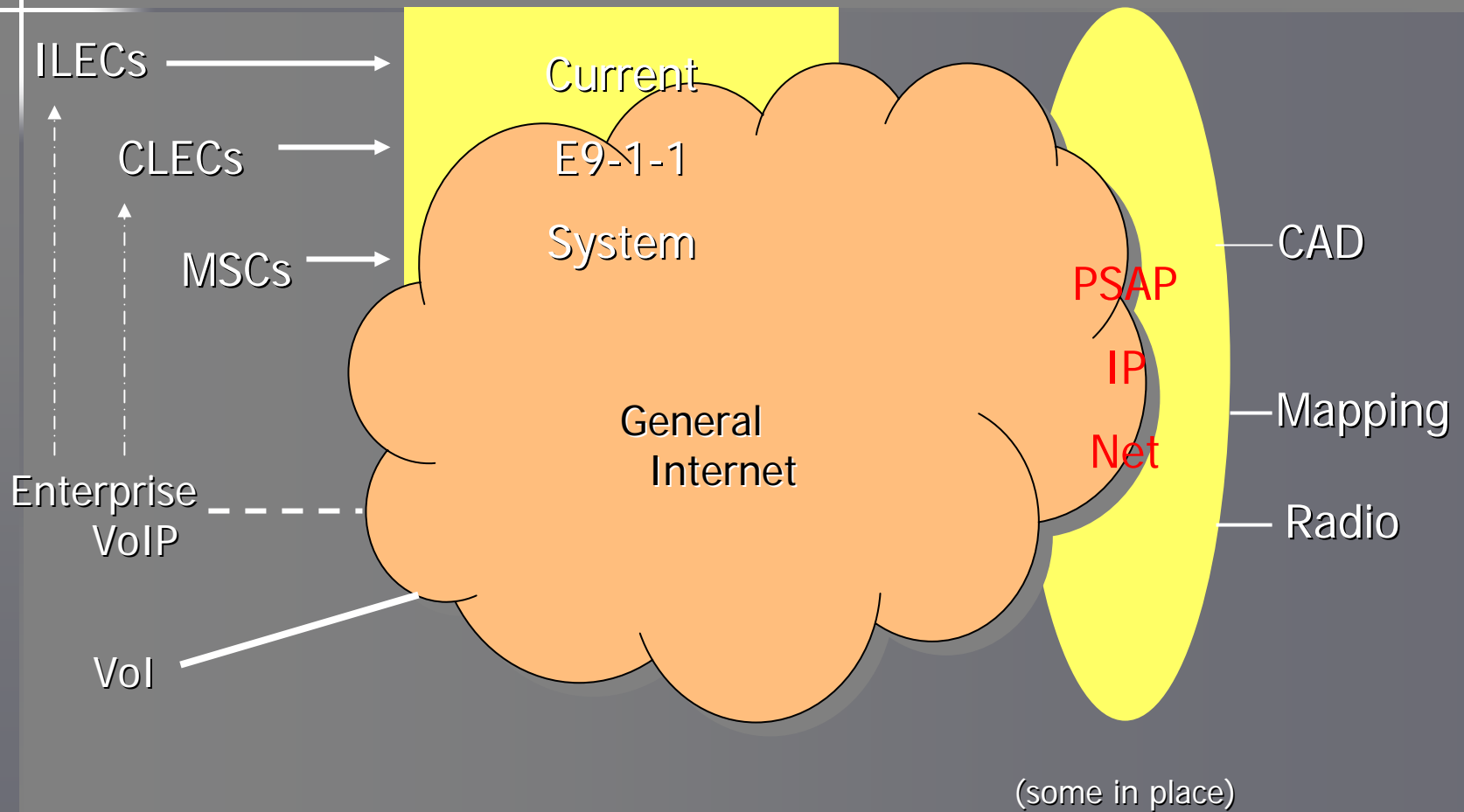
Some Would Say:



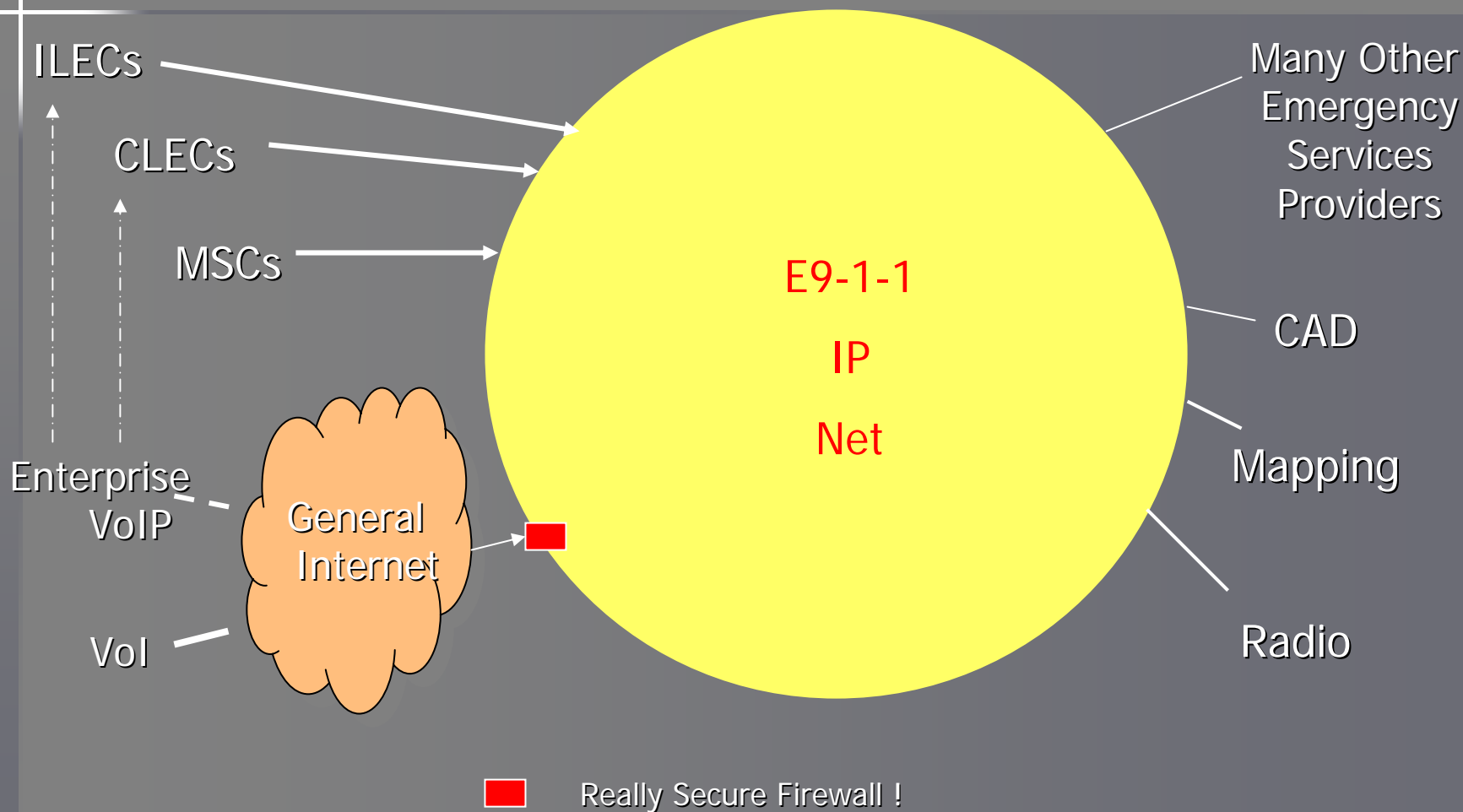
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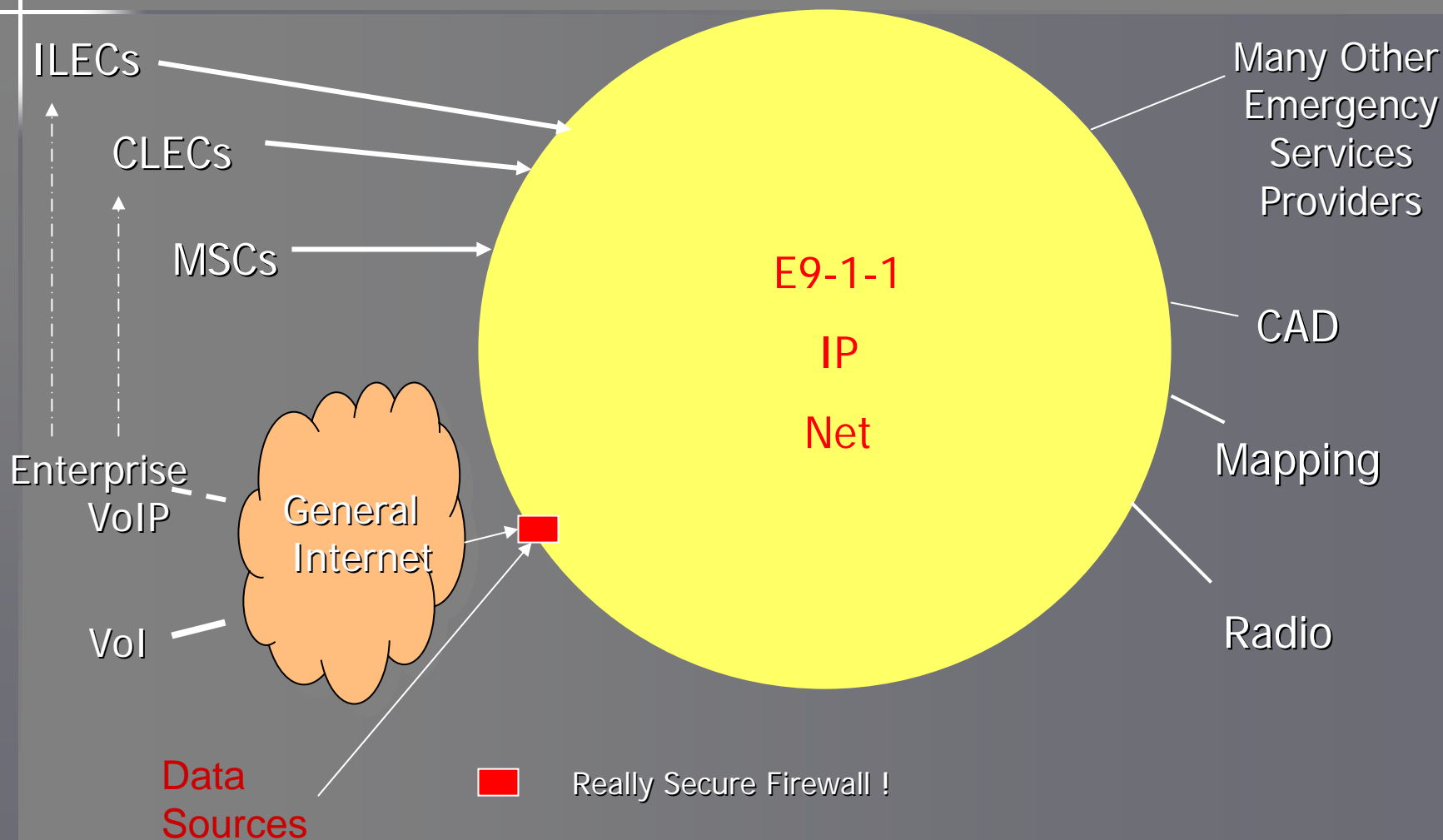
Or:



NENA Future Path Plan:



NENA Future Path Plan:



NENA-IETF 'i3' Proposal



The basis for NG9-1-1

- Internet-originated calls/messaging makes big 'I' Internet part of the call path
- Other 'call' sources may be interfaced for E9-1-1 using IP, BUT not via the general Internet
 - Robust security and authentication between the Internet, the specialized/'private' IP E9-1-1 Net, and PSAPs.
 - Primary E9-1-1 functions supported 'virtually' within the IP protocol
 - PSAP(s) will be on a private IP net
 - PSAP(s) may have specialized VSP for Emergency Services

NENA-IETF NG9-1-1 Proposal

Fixed, nomadic and true mobile clients supported

Multiple media types supported (voice, text, indicator data, video, etc)

International operation supported

No assumption of e.164 telephone number addressing

No specific carrier presumed



NENA-IETF NG9-1-1 Proposal

NG9-1-1 Requirements near completion

Over 250 requirements identified to date

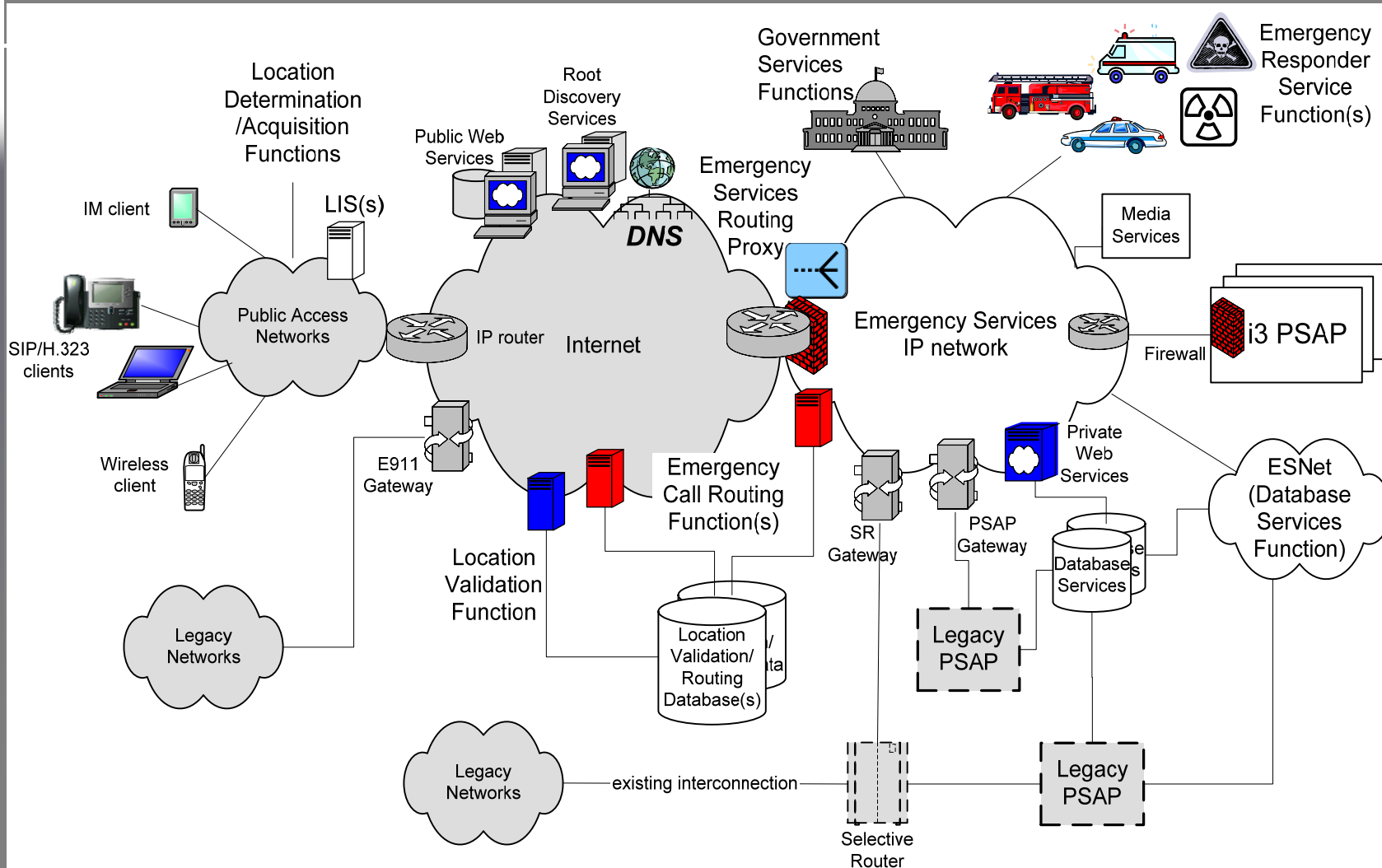
Formal review underway now

Being utilized in Texas A&M trial

Will be major input to DoT NG9-1-1 project

NENA-IETF NG9-1-1 Proposal

Where do net sensors fit?



NG9-1-1 Evolution

2000-2001 - 9-1-1 Future Path Plan

2003 – began IP and E9-1-1 work

2004 – published IP PSAP recommendations

2005 – published Interim Solution for VoIP E9-1-1

Jan 06 – Version 1 of NG9-1-1 Requirements

2Q 06 – complete NG9-1-1 basic design

NENA Standard

3Q 06 – Review of Requirements and Design Standard

NENA

VoIP/Packet Technical Committee



Chair – Nate Wilcox

Migratory Working Group – Mark Lewis
(Interim Solution standard published)

Long Term Working Group – Brian Rosen

Location Working Group – Nadine Abbott

Three other WGs already completed work

NENA Public Info Sources

- Future Path Plan available at <http://www.nena.org/9-1-1TechStandards/>
follow link on left to Future Path Plan
- Posted 081904 to NENA web site is:
NENA Technical Lead Team Policy Position on IP and E9-1-1
available at www.nena.org, then VoIP and IP
- Several other policy, descriptive documents, and links are also available at the same VoIP / IP subpage
- Interim Solution standard 08-001 is posted under 'Standards'

Related NENA Activities

- VoIP Operations committee
 - Funding/regulatory working group
 - IP PSAP working group
 - Hot issues working group
 - Others
- EAB and VoIP course development and offerings
 - Courses and Webinars
- Responded to the DoT NG9-1-1 Project RFP
 - 2 year (2007-2008) systems engineering and Proof of Concept
- NENA NG9-1-1 Transition Working Group starting in August 2006

NENA Interactions in USA



- Congress (various Committees, 9-1-1 Caucus)
- NRIC Advisory Council and Committees (1B, 1D)
- FCC
- NARUC
- VON Coalition
- IETF
- Various other SDOs (PTSC, 3GPP2, etc)
- Canadian CISC
- Global IP Alliance
- Nippon Tel (NT&T)
- ETSI, EMTEL & EENA—The European Connection
- ATIS/ESIF Next Gen Emergency Services subcommittee

Outstanding 9-1-1 Questions

How do we safely transition from current to new ?
– MUST maintain current E9-1-1 service levels

How will service and transition objectives be set ?

How will NG9-1-1 service and operations performance standards be set and evaluated against new solutions?

What will it cost, and how will it be funded ?

How will the overall transition be managed ?
– Semi-randomly by market forces, or by directive influence from the FCC, NARUC, others?

Enabling Factors

Several parallel actions are needed to realize the efficiencies, service capabilities and related opportunities:

Funding revision

While the costs of E9-1-1 are likely to be significantly reduced through this evolution, funding replacement and development/ implementation costs will require new money in the short term.
A proactive resolution is needed on a national scale.

Strategy

Common objectives and convergence of efforts among the various parties is needed to avoid duplication and cross purposes.

Public Policy

Clarification of needs and approaches requires that a lead party step forward.

Enabling Factors

Education

The inevitability, and long term cost savings, of a revised E9-1-1 system structure must be brought home to the PSAP community, in conjunction with negating funding issues, in order to gain grass roots support for taking action. Parallel consumer education is also needed.

Clear Transition Plan

rather than multiple, possibly conflicting variations

National Project Management

Either direct or supportive. Has to be better organized than wireless.

Others?

Consolidated Efforts

NENA supports consolidation of solution efforts
Best solutions with more complete design, faster
true availability, and with less cost

In the interest of the public's safety

In the interest of national security

In the interest of efficient resource use

Consolidation of joint efforts must be **part of the plan**, not just assumed.

NENA's parallel action:



NENA NG E9-1-1 Partner Program



NENA's NG E9-1-1 Program

Accelerate NG9-1-1 as national project

Partners - critical mass of 9-1-1 industry and new players

Convergence of effort

Resolve enabling factors

- Funding
- Policy
- Jurisdiction
- Data Access
- Location Identification/Call Routing
- Requirements and Standards
- Trials / demos
- Interoperability
- Disaster Planning
- Education at all levels

NENA's NG E9-1-1 Program Partners

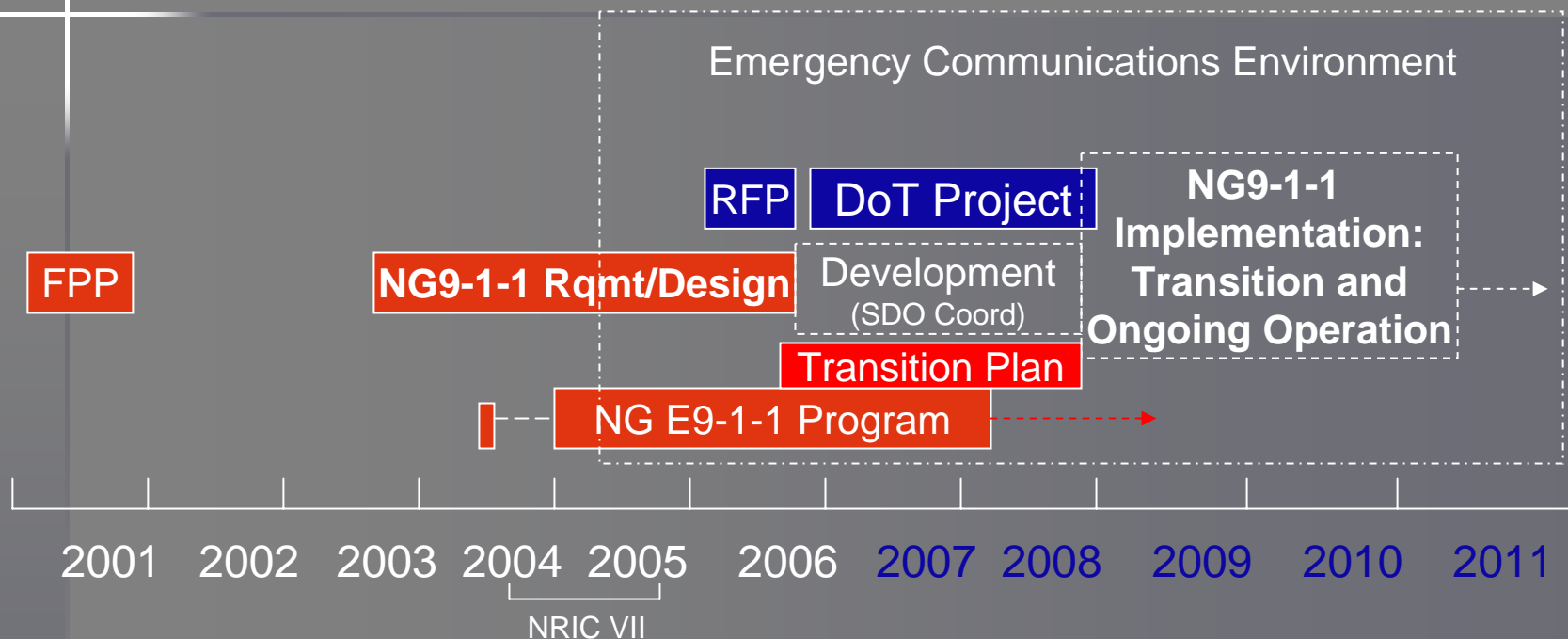


American Association of
Poison Control Centers



Texas 9-1-1 Alliance

NG9-1-1 Activity Relationships



DoT Project is System Engineering, Development and Proof of Concept oriented.

(6 month test bed trial expected in mid 2008)

BUT: will full trial be needed in addition to DoT project ?

QUESTIONS ?